

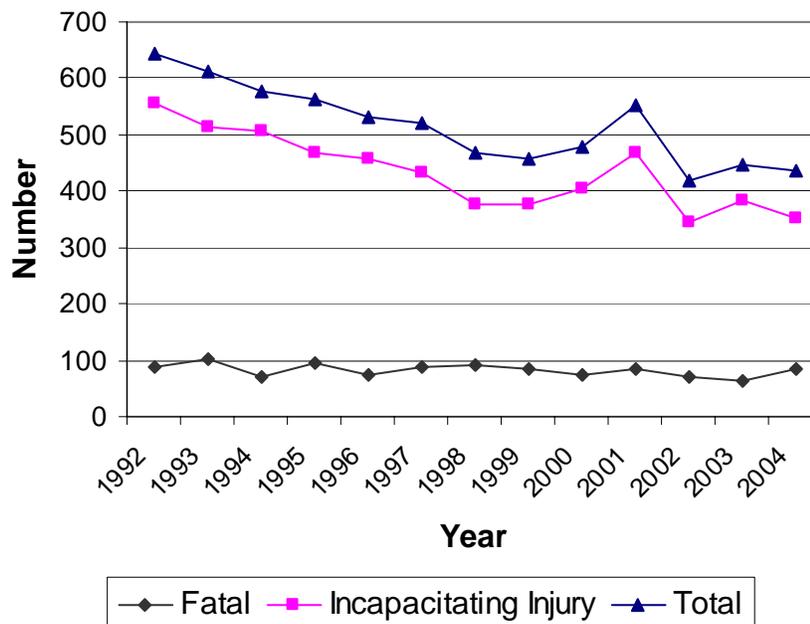
Strategic Highway Safety Plan for Vermont

1. Background and Purpose

Vermont's existing traffic safety programs and measures have contributed to maintaining motor vehicles related fatalities and injuries¹ per 100 million vehicle miles traveled below national levels over the past several years. For example, in 2003, Vermont's injury and fatality rates were 55.7 and 0.87 respectively, compared to 100 and 1.48 nationally.

Figure 1 displays the historical trend in crashes that resulted in fatalities and incapacitating injuries in Vermont between 1992 and 2004. As is evident in this Figure, the total number of major crashes steadily declined between 1992 and 1999 before increasing in 2000 and 2001, declining again in 2002, and increasing somewhat again in 2003 and 2004. Despite these fluctuations, the total number of major crashes was substantially less in 2004 (437 crashes) than in 1992 (643 crashes), representing a 32 percent decrease in the annual number of major crashes during the time period.

Figure 1. Vermont Major Crashes, 1992-2004



Despite the declining trends of the last few years, the fact remains that in Vermont, for the past five years, an average of 700 persons have been seriously injured and another 83 persons have died each year from being in a motor vehicle crash. The consequence to individuals, families and the society are considerable. The economic impact on a family, especially if the victim is the primary income, can shatter the immediate future of the family. The economic impact on a business can be equally devastating in terms of loss of a valued employee and the potential loss of business. While the human suffering is enormous and often immeasurable, the economic impact of major crashes also bears consideration. Vermont estimates of economic losses caused by fatal and serious injury

¹ In this plan, crashes that result in fatalities and incapacitating injuries are referred to as "major crashes".

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crashes were at least \$483 million in 2004. Economic factors pertaining to the cost of highway fatalities show that 75% of the cost of a crash is paid by private insurers and health care.

Although the efforts that have been made in the past clearly contributed to the overall reduction in major crashes in Vermont over the last fifteen years, a new approach is needed if we, as a State, are to make more significant gains in reducing deaths and injuries on Vermont roads.

The American Association of State Highway and Transportation Officials (AASHTO) has developed a framework for comprehensive highway safety planning that has the promise of making those significant gains beyond current numbers. The framework emphasizes addressing areas where significant reductions in crashes can be achieved and involves safety stakeholders from all jurisdictions within a State evaluating the State's safety needs based on hard data and formulating and implementing countermeasures to improve safety. This framework work is referred to as the Strategic Highway Safety Plan (SHSP).

At the basis of the Strategic Highway Safety Plan concept is the recognition that highway safety is not the affair of only one organization in one specific domain but the responsibility of many organizations in many domains. In the world of highway safety, these domains are referred to as the four E's, namely, Engineering, Education, Enforcement and Emergency Services. Also at the basis of this concept is the understanding that resources are limited and that resources should be used where the return is expected to be the greatest. AASHTO has identified twenty-two such emphasis areas where it is believed that a significant number of major crashes could be prevented. These twenty-two areas are listed in Table 1.

Table 1. AASHTO's 22 Emphasis Areas

Emphasis Areas	
Part 1: Drivers	<ol style="list-style-type: none">1. Instituting Graduated Licensing for Young Drivers2. Ensuring Drivers are Licensed and Fully Competent3. Sustaining Proficiency in Older Drivers4. Curbing Aggressive Driving5. Reducing Impaired Driving6. Keeping Drivers Alert7. Increasing Driver Safety Awareness8. Increasing Seat Belt Use and Improving Airbag Effectiveness
Part 2: Special Users	<ol style="list-style-type: none">9. Making Walking and Street Crossing Easier10. Ensuring Safer Bicycle Travel
Part 3: Vehicles	<ol style="list-style-type: none">11. Improving Motorcycle Safety and Increasing Motorcycle Awareness12. Making Truck Travel Safer13. Increasing Safety Enhancements in Vehicles
Part 4: Highways	<ol style="list-style-type: none">14. Reducing Vehicle-Train Crashes

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Table 1. AASHTO's 22 Emphasis Areas

	15. Keeping Vehicles on the Roadway
	16. Minimizing the Consequences of Leaving the Road
	17. Improving the Design and Operation of Highway Intersections
	18. Reducing Head-On and Across-Median Crashes
	19. Designing Safer Work Zones
Part 5: Emergency Medical Services	20. Enhancing Emergency Medical Capabilities to Increase Survivability
Part 6: Management	21. Improving Information and Decision Support Systems
	22. Creating More Effective Processes and Safety Management Systems

Source: AASHTO Strategic Highway Safety Plan

Currently, State, regional and local organizations have been carrying out a number of independent safety initiatives that individually have helped to reduce injuries and fatalities on highways. The Strategic Highway Safety Plan provides a detailed guide for multiple jurisdictions to collaborate on delivering safety services more efficiently and effectively and where it counts the most.

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2. Vermont's SHSP Development Process

The Vermont Agency of Transportation, along with the Vermont Department of Public Safety, the Vermont Department of Education, the Vermont Department of Health and the Vermont Department of Labor coordinated the development of the Strategic Highway Safety Plan for Vermont. Because the responsibility for highway safety is spread among a large number of entities, it was the intent that this plan be developed in conjunction with other safety partners from agencies and organizations at the State, local and private sector levels.

To assure collaboration and communication, organizations responsible for highway safety in Vermont were sent a letter from the Governor inviting them to attend a kick-off meeting in December 2005 to explain the purpose of the Strategic Highway Safety Plan and to seek their opinions as to problem safety areas. The same organizations were invited again in January 2006 to a second meeting, this time to commit time towards the development of the plan. The group was divided into smaller task teams and continued to meet at regular intervals throughout the development process. Organizations responsible for highway safety in Vermont were again invited in September 2006 to a meeting to finalize the set of strategies to be included in the SHSP.

The Strategic Highway Safety Plan is data driven and focused on the four E's as well as on a subset of AASHTO's 22 emphasis areas. The key elements of the Strategic Highway Safety Plan include a measurable goal, a manageable number of critical emphasis areas and a set of related critical strategies. For each critical strategy, a work plan is proposed. The work plans describe in general how a strategy will be implemented and include directions as to the time frame, the organizations involved and the performance measures sought. An action plan is the tool used to implement a work plan. An action plan is specific to an individual organization and explains how and when the organization will implement the assigned strategies. The final implementation of a strategy is the responsibility of individual organizations, some of which might not have been involved in the development process.

2.1 Management & Oversight Structure

Top management's support for safety planning is critical to ensure consistent and comprehensive plan development and successful implementation. For this reason, the safety planning structure illustrated in Figure 2 is being followed for the development and implementation of the SHSP. This structure involves three principal groups, namely, an Executive Committee, a Core Group, and a Working Group.

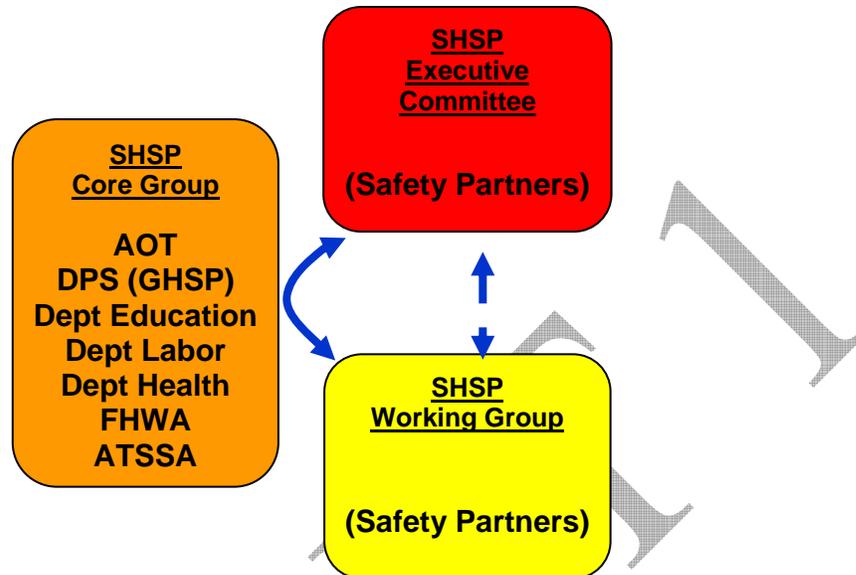
The **Executive Committee** provides overall direction to the plan development and makes key decisions. This committee is primarily composed of the Secretary and the Commissioners of the following State Agencies: Agency of Transportation, Public Safety, Education, Health and Labor. Membership to this committee is open to other leaders of groupings of safety partner organizations (e.g. Chiefs of Police Association).

The **Core Group** is comprised of Agency of Transportation and Governor's Highway Safety Program staff along with representatives from the Vermont Departments of Education, Health and Labor, the Federal Highway Administration and the American Traffic Safety Services Association. This group provides the continued overall

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management of the plan development and implementation. They interact directly with the Executive Committee and the Working Group.

Figure 2. Management & Oversight Structure



The **Working Group** guides the technical work of the process, including developing goals, objectives, and alternatives. This group is composed of all the individuals from all the safety related organizations that have volunteered to participate to the development of the Strategic Highway Safety Plan. The Working Group is further divided into Task Teams, one for each of the critical emphasis areas. These **Task Teams** are composed of individuals from each of the four E's and are responsible for developing strategies and work plans. Table 2 lists, for each Task Team, the names of the organizations that have participated in the development of the plan.

Table 2. Distribution of Safety Partners among the 7 Task Teams

Curbing Speeding and Aggressive Driving

- Governor's Highway Safety Program
- Burlington Police Department
- Department of Motor Vehicles Enforcement
- Rutland County Sheriff's Department
- Vermont Criminal Justice Training Council
- South Burlington Police Department
- Vermont State Police
- VT Department of Labor

Keeping Drivers Alert

- VAOT Roadway Design
- Federal Motor Carrier Safety Administration
- Addison County RPC
- Central Vermont RPC
- Lamoille County RPC
- VT Department of Labor

Keeping Vehicles on the Roadway

- VAOT Traffic Operations

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Reducing Impaired Driving

Department of Motor Vehicles
Dept of Disabilities Traumatic Brain Injury
Governor's Highway Safety Program
State's Attorney's Dept
VDH/ADAP/Project Crash
VAOT Traffic Operations
Essex Junction Police Department
Department of Corrections

VAOT Maintenance District 7
Barre Town Public Works
American Traffic Safety Services Association
Hinesburg Town Administrator

Increasing Seat Belt Use

VT Department of Education
VT Department of Labor
Governor's Highway Safety Program
VT State Police
Springfield Police Department

Improving Design/Operation of Intersections

American Traffic Safety Services Association
Vermont State Police
VAOT Traffic Design
Stowe Public Works
VAOT Safe Routes to School
VAOT Materials and Research
VAOT Maintenance District 7
CCMPO
Co-Operative Insurance Company

Improving Young Driver Safety

Rutland Police Department
Mt. Mansfield Union High School Drivers Ed
Co-Operative Insurance Company
VAOT Highway Research
VT EMS

2.2 Mission and Overall Goal

The mission statement of the Strategic Highway Safety Plan provides directions for the development of the governing goal and the selection of strategies and formulation of action plans. The following mission statement was adopted for the Strategic Highway Safety Plan.

The mission of the Vermont Strategic Highway Safety Plan is to minimize the occurrence and severity of crashes, related human suffering and economic losses on the Vermont transportation network. We will accomplish this by identifying and implementing achievable and effective education, enforcement, engineering, and emergency response initiatives.

To make significant progress in achieving the mission statement, the governing goal of the Strategic Highway Safety Plan must be specific and be expressed in terms of reductions in both the number of fatal and serious injury crashes and the number of fatalities and serious injuries to be attained in a given time period. As such, collectively, efforts generated through the Strategic Highway Safety Plan will achieve the following target goal.

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The goal of the Vermont Strategic Highway Safety Plan is to reduce the number of major crashes to 350 or fewer each year by 2010 (from 437 in 2004) thus resulting in 40 fewer fatalities and 26 fewer incapacitating injuries per year.

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3. Prioritization of AASHTO's Emphasis Areas

As mentioned previously, the list of 22 emphasis areas proposed by AASHTO is a comprehensive list of the areas that offer the most opportunities for improving road safety. The purpose of prioritizing this list of 22 emphasis areas is to identify the specific set of areas that offers the greatest potential for reducing major crashes in Vermont. To successfully achieve the goal of the Strategic Highway Safety Plan, this set of areas must be manageable in number given limited resources. Accordingly and based on the guidance of peers from other States and AASHTO, the Core Group decided to identify five to seven critical emphasis areas.

To assist in the determination of these areas, two methods were followed. One involved comparing the 22 emphasis areas to Vermont crash data while the other method sought the opinions of those involved with the four E's on a day-to-day basis.

3.1 Prioritization Using Vermont Crash Data

Vermont crash data for the five most recent available years at the time of analysis was evaluated with respect to the 22 emphasis areas. The crash data used represented all the crash reports that were submitted by law enforcement agencies to the Vermont Department of Motor Vehicles during the period of interest. The Vermont Center for Justice Research was retained to quantify the magnitude of the problem for each of the emphasis areas by identifying historical trends for the five-year period covering 1999 to 2003.

For this five-year period, the number of major crashes totaled 2,354, with 377 fatal crashes and 1,977 incapacitating injury crashes while the total number of fatalities and incapacitating injuries was 3,028.

Table 3 provides a summary of the number and the percentage of major crashes for the 22 emphasis areas. In this table, whenever an emphasis area cannot be characterized by crash data, the letters "NA" are displayed next to the emphasis area. In the case of seat belt use, the percentage shown is based on person injuries and fatalities and represents the occupants who died or who were seriously injured and who did not use a restraint device.

From this table, four characteristics stand out in their relatively strong associations with crashes that resulted in fatalities and incapacitating injuries. These areas include keeping vehicles on the roadway (38 percent of major crashes); driver under the age of 21 (27 percent of major crashes); crashes at intersections (25 percent of major crashes); and vehicle occupants fatally/severely injured not wearing a restraint device (24 percent of total fatalities/severe injuries). Three additional areas represent smaller but still sizable percentages of crashes: alcohol-related crashes (19 percent of crashes); crashes involving speeding and aggressive driving (15 percent of major crashes); and inattention (14 percent of major crashes). Five of the above areas focus primarily on driver behavior while the other two focus on road characteristics.

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Table 3. Summary of Major Crashes by Emphasis Areas, 1999-2003

	Emphasis Areas	Vermont Major Crashes	Percent
Part 1: Drivers	1. Instituting Graduated Licensing for Young Drivers	636 major crashes involved a driver under the age of 21 (out of 2,354 major crashes)	27%
	2. Ensuring Drivers are Licensed and Fully Competent	127 Citations for DLS/operating with no license (out of 2,354 major crashes)	5%
	3. Sustaining Proficiency in Older Drivers	164 major crashes involved a driver between the ages of 65 and 74	7%
		153 major crashes involved a driver over the age of 74	6%
	4. Curbing Aggressive Driving	347 major crashes listed excessive speed, following too closely or driving in erratic, reckless or aggressive manner as a contributing factor	15%
	5. Reducing Impaired Driving	439 major crashes were alcohol related	19%
	6. Keeping Drivers Alert	336 major crashes listed inattention or fatigued, asleep as a contributing factor	14%
		84 major crashes listed driver's condition as fell asleep, fatigued, etc	4%
7. Increasing Driver Safety Awareness	-NA-		
Part 2: Special Users	8. Increasing Seat Belt Use and Improving Airbag Effectiveness	739 vehicle occupants fatally/severely injured (out of 3,028 total fatalities/severe injuries) were not using a restraint device	24%
	9. Making Walking and Street Crossing Easier	160 major crashes involved pedestrians	7%
	10. Ensuring Safer Bicycle Travel	48 major crashes involved bicyclists	2%

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Table 3. Summary of Major Crashes by Emphasis Areas, 1999-2003

	Emphasis Areas	Vermont Major Crashes	Percent
Part 3: Vehicles	11. Improving Motorcycle Safety and Increasing Motorcycle Awareness	205 major crashes involving motorcycles	9%
	12. Making Truck Travel Safer and Fully Competent	176 major crashes involving heavy trucks	7%
	13. Increasing Safety Enhancements in Vehicles	-NA-	
Part 4: Highways	14. Reducing Vehicle-Train Crashes	1 major crashes involving a collision with a train	0%
	15. Keeping Vehicles on the Roadway	901 major crashes involving running off the road	38%
	16. Minimizing the Consequences of Leaving the Road	Major run-off the road crashes - Overturned (27.0%) - Collision with tree/large bush (26.9%) - Collision with pole/sign (13.3%) - Collision with guard rail/curb (12.7%) - Collision with other fixed object (12.3%) - Collision with ledge/boulder (7.8%)	
	17. Improving the Design and Operation of Highway Intersections	580 major crashes at an intersection	25%
	18. Reducing Head-on Crashes	280 major head-on crashes	12%
	19. Designing Safer Work Zones	14 major crashes in work zones	1%
Part 5: EMS	20. Enhancing Emergency Medical Capabilities to Increase Survivability	-NA-	
Part 6: Management	21. Improving Information and Decision Support Systems	-NA-	
	22. Creating More Effective Processes and Safety Management Systems	-NA-	

3.2 Prioritization by Vermont Safety Partners

A workshop to kick-off the plan development process was held on December 12, 2005. The meeting was hosted at Vermont Union College from 10:00 am to 3:00 pm. Over 100

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safety partners from 63 different public and private organizations attended this kick-off meeting.

The purpose of the meeting was to invite safety partners to work together towards reducing fatal and serious injury crashes. A large part of the meeting was spent introducing the strategic highway safety planning process to safety partners and to present the results of the data analysis described in the previous section. In the afternoon, participants were divided into small groups to discuss AASHTO's 22 emphasis areas. At the end of the group discussions, each participant was asked to cast three votes for what he or she felt were the most important areas for reducing major crashes in Vermont. Table 4 presents the results of the voting for all 22 emphasis areas. A review of this table indicates that the elements identified by the safety partners as being most likely to have a significant effect on the number of major crashes in Vermont corresponded to the same emphasis areas identified in Task 1 of the data analysis.

Table 4. Safety Partners' Priorities by Emphasis Areas

Emphasis Areas		Percent (votes)
Part 1: Drivers	1. Instituting Graduated Licensing for Young Drivers	9%
	2. Ensuring Drivers are Licensed and Fully Competent	4%
	3. Sustaining Proficiency in Older Drivers	0%
	4. Curbing Aggressive Driving	16%
	5. Reducing Impaired Driving	13%
	6. Keeping Drivers Alert	6%
	7. Increasing Driver Safety Awareness	2%
	8. Increasing Seat Belt Use and Improving Airbag Effectiveness	17%
Part 2: Special Users	9. Making Walking and Street Crossing Easier	1%
	10. Ensuring Safer Bicycle Travel	0%
Part 3: Vehicles	11. Improving Motorcycle Safety and Increasing Motorcycle Awareness	3%

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Table 4. Safety Partners' Priorities by Emphasis Areas

	Emphasis Areas	Percent (votes)
	12. Making Truck Travel Safer and Fully Competent	1%
	13. Increasing Safety Enhancements in Vehicles	0%
Part 4: Highways	14. Reducing Vehicle-Train Crashes	0%
	15. Keeping Vehicles on the Roadway	9%
	16. Minimizing the Consequences of Leaving the Road	3%
	17. Improving the Design and Operation of Highway Intersections	10%
	18. Reducing Head-on Crashes	2%
	19. Designing Safer Work Zones	1%
Part 5: EMS	20. Enhancing Emergency Medical Capabilities to Increase Survivability	0%
Part 6: Management	21. Improving Information and Decision Support Systems	0%
	22. Creating More Effective Processes and Safety Management Systems	0%

3.3 Selected Critical Emphasis Areas for Vermont

To establish the set of critical emphasis areas that will serve as the focus of the Strategic Highway Safety Plan for Vermont, the Core Group reviewed the information obtained from the two prioritization methods performed. Table 5 summarizes this information for the top seven emphasis areas from each method. As can be seen, the two prioritization methods generated the same list of critical emphasis areas. Consequently, the emphasis areas listed in this table represent the critical emphasis areas selected for the Vermont Strategic Highway Safety Plan. Note that, in this table, the critical emphasis areas are ranked in descending order of their percentage of major crashes.

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Table 5. Critical Emphasis Areas Selected for Vermont

Emphasis Areas	Vermont Major Crashes	Percent (major Crashes)	Percent (Partners' Vote)
Keeping Vehicles on the Roadway & Minimizing the Consequences of Leaving the Road	Vehicles leaving the road	38%	12%
Young Drivers	Drivers under the age of 21	27%	9%
Improving the Design and Operation of Highway Intersections	Crashes at intersection	25%	10%
Increasing Seat Belt Use & Improving Airbag Effectiveness	Vehicle occupants fatally/severely injured unrestrained	24%*	17%
Reducing Impaired Driving	Alcohol related	19%	13%
Curbing Speeding and Aggressive Driving	Aggressive driving	15%	16%
Keeping Drivers Alert	Inattention	14%	6%

*Percent based upon total fatalities/severe injuries

Table 5 identified broadly the type of major crashes affected by each of the seven critical emphasis areas. More specifically, the definitions listed below are used to describe the seven emphasis areas.

Keeping Vehicles on the Roadway includes the major crashes in which a vehicle ran off the road and or overturned and or collided with a tree, a pole or a sign, a guardrail, ledge or boulder or any other fixed object.

Improving Young Driver Safety includes the major crashes in which drivers were under 21 years of age and that resulted in fatal or incapacitating injuries.

Improving Design/Operation of Intersections includes the crashes that took place at an intersection and that resulted in fatal or incapacitating injuries.

Increasing Seat Belt Use includes the crashes in which vehicle occupants who were not using a restraint, such as shoulder and lap belt, shoulder belt only, lap belt only, child safety restraint and or airbag, suffered fatal or incapacitating injuries.

Reducing Impaired Driving includes the major crashes resulting in fatal or incapacitating injuries and for which the crash reports indicated that at least one driver was operating under the influence of medicine, drugs or alcohol or had been drinking;

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and or that a driver was cited for DUI, and or that the BAC or drug test result was positive.

Curbing Speeding and Aggressive Driving includes the major crashes the resulted in fatal or incapacitating injuries and in which at least one of the drivers was reported to either having driven at an excessive speed, followed too closely or driving erratically, recklessly or in an aggressive manner.

Keeping Drivers Alert includes the major crashes that resulted in fatal or incapacitating injuries and in which at least one of the drivers was reported to have inattention, fatigued or asleep as a contributing factor to the crash or in which one of the drivers had a driver's condition listed as fell asleep or fatigued.

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